

wherein R is an alkyl group of about 1 to about 6 carbon atoms; Z is an unsubstituted divalent phenyl or a divalent phenyl substituted with at least one moiety selected from the group consisting of alkyl, alkoxy, halogen, nitro, cyano, and carboalkoxy groups; Z' is an unsubstituted quinoidal phenyl or a quinoidal phenyl substituted with at least one moiety selected from the group consisting of alkyl, alkoxy, halogen, nitro, cyano, and carboalkoxy groups; and X is an anion of a strong acid, and compounds of the formula (II):



wherein R is an alkyl group of about 1 to about 6 carbon atoms; Z is an unsubstituted divalent phenyl or a divalent phenyl substituted with at least one moiety selected from the group consisting of alkyl, alkoxy, halogen, nitro, cyano, and carboalkoxy groups; and X is an anion of a strong acid;

- (b) about 20 % by weight to about 60 % by weight of a carrier vehicle; and
 - (c) about 40 % by weight to about 80 % by weight of a solvent system, each based on the total weight of the composition.
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REMARKS

Claims 2-4, 6-19 and 30 are pending in the application. Claims 2, 3, 6, 9, 10, 11, 12, 13, 16, and 19 have been amended. No new matter is added by the amendments. Support for the amendments is found at least in claims 1-29 as originally filed.

New claim 30 has been added. New claim 30 does not encompass new subject matter; it is merely a re-presentation in independent form of the dependent claim 5, now cancelled.

Claims 1 and 5 have been cancelled without prejudice.

As a threshold matter, it is requested that the Examiner make of record the prior art references listed in the Information Disclosure Statement, filed December 4, 2000, and those listed in the Supplemental Information Disclosure Statement submitted herewith, and return the initialed Forms PTO-1449 and PTO/SB/08A to the applicants' representative at the earliest opportunity.

I. Rejections Under 35 U.S.C. § 112, second paragraph.

The Examiner has rejected claims 6-8, 10, 12, and 19 under 35 U.S.C. § 112, second paragraph stating that these claims are indefinite for failing to particularly point out and distinctly claim the subject matter that the applicants regard as the invention. Specifically, the Examiner points out four grounds upon which she states the claims are indefinite.

First, the Examiner rejects claim 6 for use of the language “at least one ... and mixtures thereof.” Claim 6 has been amended to delete that portion of the claim reciting “and mixtures thereof.”

Also with respect to claim 6, the Examiner objects to use of the phrase “derivatives thereof.” The applicants respectfully traverse this rejection. A person of skill in the art would have understood that derivatives of the recited polymers include those having structures substantially similar to those specific recited polymers, but which may have various functional groups substituted along the backbone and/or side chains of the polymer. Use of the term does not render the claims indefinite, as a person of skill in the art would be able to discern the metes and bounds of the claim as written.

The Examiner has asserted that claim 10 is indefinite as the type of molecular weight is not specified. Claim 10 has been amended to recite that the molecular weight is number average molecular weight. Such amendment does not constitute new matter, as a person of skill in the art would have known that when describing polymers, such as those recited in claim 10, the molecular weight is conventionally a number average molecular weight, even though it is only referred to as “molecular weight.” Weight average molecular weights are only provided in particular circumstances, one referring to polymers, and in those circumstances the values are specifically identified as being “weight average.”

The Examiner has rejected claims 12 and 19 for use of the compound “dimethyl amino ethyl metacrylate.” The claims have been amended to recite the properly spelled dimethylaminoethylmethacrylate. Thus, the rejection is no longer applicable and its withdrawal is requested.

Accordingly, for at least the reasons given above, it is respectfully submitted that the claims are fully compliant with 35 U.S.C. § 112. It is requested that the Examiner reconsider and withdraw the rejections.

II. Rejection Under 35 U.S.C. § 102(e) or, in the Alternative, 35 U.S.C. § 103(a) Based Upon U.S. Patent No. 5,998,535.

The Examiner has maintained the rejection of claims 1, 2, 6-9, 11-13, 15, and 16 under 35 U.S.C. § 102(e) as being anticipated by, or, in the alternative under 35 U.S.C. § 103(a) as obvious over the disclosure of U. S. Patent No. 5,998,535 of Haldankar. As basis for this rejection, the Examiner relies upon the Haldankar paint formulation containing a black pigment (Raven 5000), 17.0 grams, dispersant resin (hydroxyl-functional polymer), 65.4 grams, methylamyl ketone, 17.6 grams and steel balls, 400 grams.

The Examiner has also rejected claims 10 and 14 as being obvious under 35 U.S.C. § 103(a) over Haldankar.

The applicants respectfully traverse each of the rejections based upon Haldankar.

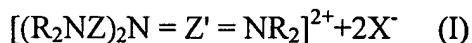
In order to anticipate an invention, the reference must teach each element of the invention as claimed. In the present case, Haldankar does not teach at least two elements of the claim.

Haldankar discloses a polymeric dispersant. The dispersant is a free radical addition polymerization reaction product of a mixture of monomers. The monomers are a styrene monomer, an alkyl methacrylate monomer having one to eight carbon atoms in the alkyl group, an alkyl methacrylate monomer having greater than eight carbon atoms in the alkyl group, an alkyl acrylate monomer having from one to eighteen carbon atoms in the alkyl group, a hydroxyl-functional ethylenically unsaturated monomer, and a specific acrylate or methacrylate monomer having an amine functionality. Col. 2, lines 1-24. Thus, as the polymeric dispersant is a polymerization reaction product of a mixture of these monomers, the resultant reaction product contains each of the monomers. Haldankar teaches that this dispersant can be used to formulate a “pigment dispersion composition” and/or a “surface coating composition.”

The pigment dispersion and/or the surface coding composition of Haldankar may further contain pigment components. Representative pigments include white pigments, such as titanium dioxide, zinc oxide, antimony oxide and organic or inorganic chromanic pigments, such as iron oxide, carbon black, phthalocyanine blue, etc.

Haldankar does not teach or suggest a liquid composition for coating surfaces that contains (i) a near infrared absorbing agent of formula (I) or formula (II) or (ii) the carrier vehicle of the invention. In Haldankar, the asserted near infrared absorbing agent is carbon

black. In contrast, the liquid composition of the present invention contains a near infrared absorbing agent that is a compound of the formula (I):



wherein R is an alkyl group of about one to about six carbon atoms; Z is a divalent phenyl which may or may not be ring substituted with one or more alkyl, alkoxy, halogen, nitro, cyano, and carboalkoxy groups, Z' is a quinoidal phenyl which may or may not be ring substituted with one or more alkyl, alkoxy, halogen, nitro, cyano, and carboalkoxy groups; and X is an anion of a strong acid, and compounds of the formula (II):



wherein R is an alkyl group of about one to about six carbon atoms; Z is a divalent phenyl which may or may not be ring substituted with one or more alkyl, alkoxy, halogen, nitro, cyano, and carboalkoxy groups, and X is an anion of a strong acid. Thus, the disclosure of Haldankar does not each at least this element of the invention.

Further, Haldankar teaches only a polymeric dispersant that is formed from the monomers styrene, alkyl methacrylate having one to eight carbon atoms in the alkyl group; alkyl methacrylate having greater than eight carbon atoms in the alkyl group; alkyl acrylate having from one to eighteen carbon atoms in the alkyl group; a hydroxyl-functional ethylenically unsaturated monomer, a monomer having an amine functional moiety.

In contrast, the liquid composition of the present invention contains a carrier vehicle that comprises a copolymer that is formed by the polymerization of about 40% to 70% methyl methacrylate, about 10% to about 30% ethyl acrylate, about 20% to 30% diethyl amino ethyl metacrylate. The polymer reaction produced are not the same. Thus, for these reasons, Haldankar does not teach each element of the invention.

Nor does Haldankar render the claimed invention obvious. As discussed above, Haldankar is missing at least two elements of the invention as claimed. Further, a person of skill in the art would not have been motivated to make the modification of Haldankar suggested by the Examiner to arrive at the present invention. Of all the pigment components discussed in Haldankar, only carbon black has the additional characteristic of being an infrared absorbing agent. There is no discussion in Haldankar that use of near infrared absorbing agents as pigments would be beneficial, suitable, or useful in the surface coating compositions of the invention, which are specifically designed to impart pigment (color) to coated surfaces -- not to

absorb near infrared radiation. Further, as Haldankar is directed primarily to multi-purpose dispersants and formulations containing such dispersants, a person of skill would have had no motivation to make the modification which would have resulted in the present invention.

Accordingly, for at least the reasons given above, it is respectfully requested that the Examiner reconsider and withdraw the §§ 102 and 103 rejections based upon Haldankar.

III. Rejection Under 35 U.S.C. §§ 102 and 103 Based Upon Oi, Hattori, or Akiyama.

The Examiner has maintained the rejection of claims 1-19 under 35 U.S.C. § 102(b) or (e) as anticipated by, or in the alternative, under 35 U.S.C. § 103(a) as obvious over, U.S. Patent Nos. 5,778,914 (“Oi”); 6,051,361 (“Hattori”); and/or 6,136,425 (“Akiyama”), each taken individually. As basis for the rejections, the Examiner states that each of these references discloses and exemplifies near infrared liquid coating compositions defined “basically” as containing a near infrared absorbing agent, a carrier vehicle which includes at least one acrylic polymer, a solvent system, and other conventional ingredients. Therefore, according to the Examiner, each of Oi, Hattori and Akiyama individually anticipates the presently claimed invention “in both content and character.”

With respect to the asserted obviousness rejections based upon the individual references, the Examiner further states:

As to the dependent claims, the limitations are either disclosed by the patentees, suggested by the patentees, or would have been obvious to the skilled artisan with a reasonable expectation of success.

No further analysis as to how any of these references makes the claims obvious is provided, either in this Office Action or in the prior Office Action by which the Examiner refers in maintaining these rejections.

The applicants respectfully traverse the §§ 102 and 103 rejections based upon Oi, Hattori or Akiyama.

Oi teaches a near infrared absorbing compound having an improved stability and light resistance which has the structure (1) as shown, *e.g.* at col. 5, lines 1-67. Oi provides the general teaching that a “heat ray absorbing material” can be prepared from the near infrared absorbing compound of the Oi invention by (i) kneading the compound into a resin and molding the resin; (ii) preparing a coating composition containing the near infrared absorbing compound; (iii) adding the near infrared ray absorbing compound to an adhesive. Col. 12, lines 9-18. Oi teaches

that the compound (1) can be incorporated into a coating composition, but does not teach or suggest the amount of solvent to be used.

Hattori discloses a "light sensitive composition" for use as an image forming material. The composition of Hattori includes a compound capable of generating an acid on exposure of actinic light, a compound having a chemical bond capable of being decomposed by an acid, an infrared absorber, and a polymer obtained by polymerization of a polymerizable composition that comprises an ethylenically unsaturated monomer that has a solubility parameter of thirteen or more. Hattori teaches that the monomer from which this polymer may be prepared may include specific acrylic copolymers. In preparing a light sensitive plate, Hattori discloses that the compositions can be mixed with various solvents. However, Hattori does not disclose a liquid composition for coating surfaces that contains the amounts of components as recited in the claims. Further, the infrared absorber of Hattori is not that of formula (I) or (II). See, col. 16:25 to col. 35:46.

Akiyama discloses a printing material and a method of preparing a printing material. The printing material of Akiyama requires a specific support layer onto which several layers are applied, including an imaging layer that may contain an infrared light absorbent and a binder. No liquid composition containing the near infrared absorbent and/or the binder is disclosed, nor is there any disclosure of a solvent or solvent system for use with the ingredients of the imaging layer. The portion of Akiyama which the Examiner identifies as disclosing solvents (col. 29, lines 42-48) teaches only solvents for use in the preparation of the sublimation agent containing layer, the heat fusible layer, and the ablation layer on the support of the printing material system disclosed in Akiyama.

Neither of Oi, Akiyama, or Hattori, teaches all elements of the invention, and therefore neither anticipates nor renders obvious the invention. None of Oi, Hattori, or Akiyama teaches or suggests a liquid composition containing the near infrared absorbing agent of formula (I) or formula (II), and which also contains a carrier vehicle that includes a copolymer formed from the polymerization of a specific amount of methyl methacrylate, ethyl acrylate, and dimethyl amino metacrylate. Nor would a person of skill been motivated to modify any one of the disclosures of Oi, Hattori, or Akiyama. Akiyama, Oi and Hattori already teach compositions that contain specific types of near infrared absorbing agents. A person of skill would not have been motivated to substitute the disclosed near infrared absorbing agents for those of the invention.

There is no teaching or suggestion in any of the prior art references that would have caused a person of skill to seek out alternative near infrared absorbing agents.


Accordingly, for at least these reasons, it is respectfully submitted that the Examiner has failed to establish that any of the references anticipate the claimed inventions, or that modification of the invention results in a case of *prima facie* obviousness. Therefore, it is respectfully requested that the Examiner reconsider and withdraw the rejections.

CONCLUSION

In view of the foregoing, it is respectfully submitted that claims 2-4, 6-19, and 30, are in a condition for allowance as they fully comply with all statutory requirements of patentability. Reconsideration and allowance of the claims at the earliest opportunity is respectfully solicited.

Respectfully submitted,

ROBERT ROSANIA, et al.

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(Date) **KRISTYNE A. BULLOCK**
Registration No. 42,371
AKIN GUMP STRAUSS HAUER & FELD LLP
One Commerce Square
2005 Market Street, Suite 2200
Philadelphia, PA 19103-7013
Telephone: 215-965-1200
Direct Dial: 215-965-1348
Facsimile: 215-965-1210
E-Mail: kbullock@akingump.com

KAB:cmb
Enclosure
237793